STATEMENT ON PRESERVATION OF NEW YORK CITY'S DRINKING WATER QUALITY*

COMMITTEE ON PUBLIC HEALTH
The New York Academy of Medicine
New York, New York

SUMMARY

THE NEW YORK ACADEMY of Medicine recommends a reevaluation and coordination of programs to preserve the high quality of New York City's drinking water supply. It should be appreciated that nearly 50% of the population of New York State is served by this supply. Changing conditions in the city's watershed urgently require revised policies and approaches to water quality preservation to protect the health and welfare of the nine million water consumers living in New York City, Westchester County, and in many other communities north of New York City. While the age of waterborne epidemics and outbreaks seems to be past, potential sources of pollution still exist. That there have been no major outbreaks of waterborne diseases in the recent past should not lead to complacency that the problem cannot occur. The immediate need to assure adequate water quantity must not detract from efforts to preserve water quality.

BACKGROUND

New York City's water supply is world renowned for purity and excellent taste. Most of the city's watershed areas have historically been woodlands and sparsely populated rural or suburban areas. In recent years however, development and population growth in watershed areas have accelerated. Concurrent with this growth has been relaxation of policies and rules that govern water quality. A broad spectrum of pollution inputs now enter the city's "source waters" (the stream and reservoir waters that consumers eventually drink). The two growing pollution categories are: *Point Sources:* About 10 million gallons of sewage treatment plant effluent are now discharged into the city's source waters each day. These discharges originate from about 90

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treatment plants of communities and institutions in upstate New York. *Non-Point Sources:* Surface run-off containing pesticides, construction-related soil erosion, road salts, farm wastes, fertilizers, and other contaminants continuously drain into the city's source waters.

THE SUBTLE DEGRADATION OF WATER QUALITY

The discharges created by development in watershed areas have measurably degraded some of the city's source water streams and reservoirs.[1] Most impacted are the Croton waterways in Westchester and Putnam Counties:

> As a result of this development, the water quality in the Croton Reservoirs is lower than desirable for a water supply on account of the turbidity, algae growth and chemical contamination. The City is planning to filter the Croton water by the mid-1990's, but mechanical filtration alone cannot ensure a healthy water supply. Many contaminants are difficult or impossible to remove even with the more advanced treatment processes and many processes, such as diatomaceous earth filtration, do not work with heavily contaminated water.... Thus, the maintenance of the water quality of the inflows to the Croton system is of especial importance to the City. (Affidavit of Michael Principe, Acting Chief of Water Quality Control for the New York City Department of Environmental Protection, before the Supreme Court of the State of New York, County of Putnam, Index No. 1030/88, November 14, 1988.)

PRIORITY AREAS FOR REEVALUATION

The existing water quality preservation programs are administered largely by the following agencies: New York State Department of Environmental Conservation (NYS DEC), responsible for discharges into source waters; New York City Department of Environmental Protection (NYC DEP), responsible for supply of drinking water; New York State Health Department (NYS DOH), responsible for drinking water; and New York City Health Department (NYC DOH), agent for State Department of Health in this area. The New York Academy of Medicine strongly urges that these agencies coordinate their efforts to reevaluate, restructure, enhance and achieve better coordination of the programs discussed below.

State implementation of federal statutory requirements. The "marriage" between the federal Clean Water Act and the federal Safe Drinking Water Act is in need of counseling. State implementation of the federal Clean Water Act governs source water protection, and currently is allowing 10 million gallons per day of sewage treatment plant discharges into the city's unfiltered source waters. Much of this discharge is poorly treated and is likely to contain viable bacteria, parasites, and viruses; organic and inorganic compounds; and other contaminants. While these discharges into source waters are permitted, state implementation of the federal Safe Drinking Water Act governs water quality

at the consumers tap, and sets limits for maximum allowable concentrations as low as zero parts per billion or parts per million for some of these contaminants.

This paradoxical arrangement which permits contamination of the source waters on the one hand and, on the other hand, prescribes maximum levels at the tap, is resulting in deterioration of source waters and increasing reliance on filtration as a preventive public health measure. Yet as mentioned above even advanced filtration techniques should not be relied upon to protect the consumer from polluted water.

The New York Academy of Medicine advocates that the only truly preventive approach is the preservation of high quality source waters, whether or not filtration of all source waters is implemented.[2]

Filtration and source water protection. The federal Safe Drinking Water Act as amended in 1986 calls for filtration of all surface water supplies. (The act allows the United States Environmental Protection Agency [U.S. EPA] to set criteria for exempting some water supplies from filtration.)[3] However, such filtration would be expensive, cost estimates for filtering New York City's supply ranging as high as three billion dollars.[4]

The New York Academy of Medicine cautions against relying solely on filtration to protect the public. Many examples exist of waterborne disease epidemics caused by failures of filtration systems.[5] The advent of filtration also will serve as a disincentive to source water protection, causing increasing pollution loadings that in turn pose greater health risks and necessitate expensive modifications to the filtration systems.

The New York Academy of Medicine recognizes the use of filtration where cogent scientific data demonstrate that it is needed to protect the public against contaminated water. However, the Academy opposes the use of filtration as a substitute for source protection because of the inherent hazards.

Land use analysis and planning. The City of New York has asserted that New York State's environmental review procedure focuses on the singular water quality impact of each proposed development in the watershed rather than on the cumulative impact of all proposed developments.[6] The volume of waste produced by any individual development is minuscule in relation to the total volume of the city's water supply; therefore, environmental reviews commonly declare "no significant impact."

This approach excludes consideration of the long-term cumulative impacts of numerous, geographically dispersed sources of pollution sprouting up throughout the watershed. Continuation of this environmental review process will actually ensure that source water quality declines as development progresses.

A comprehensive assessment of cumulative water quality impacts from current and projected development scenarios within the entire watershed area is lacking and must be undertaken to serve as a key ingredient in developing rational water quality strategies.

Intergovernmental consensus of water preservation policies. Although jurisdictions of state and city agencies overlap on most water quality matters, policies and priorities on water quality vary and in some cases are antagonistic.

One example is that NYS DEC stocks source waters with game fish, and requires that sewage treatment plants discharging into the source waters disinfect their discharge using ultraviolet radiation rather than the customary chlorination disinfection. This requirement for ultraviolet disinfection is based on general concern that sufficient levels of chlorine residuals discharged with the effluent may be toxic to game fish in the receiving water. Ultraviolet disinfection, however, is ineffective when used on turbid effluents and/or when the ultraviolet facility is not properly contructed, operated, or maintained. All of these conditions can occur at watershed sewage treatment plants, and may result in discharge of nondisinfected wastewaters. Such discharges threaten the health of local fishermen who are in contact with source waters and to the millions of consumers of the supply.

NYS DEC's fisheries management policies conflict with NYC DEP's water treatment policies. The city's need to treat source water with copper sulfate and chlorine can be deleterious to game fish. However, these treatments are accepted water supply procedures, and are needed to protect health. Protection of human health must be recognized as the primary objective in managing the water supply. Provision of a safe and adequate water supply is the primary function of the city's water supply system. Any other proposed uses of the system should be evaluated in light of the need to protect the drinking water supply, and such other uses should be restricted.

The New York Academy of Medicine urges state and city agencies to adopt common goals, strategies, and policies that will foster water quality preservation.

Need for maximum protection of source waters and wetlands. Current water quality regulations are inadequate for protecting New York City's source waters. Consider the following. The pollution limitations placed on a sewage treatment plant discharge are predicted largely on the classification and quality of the "receiving water."[7] Waste waters in the city's watershed that discharge into source waters with the lowest class ratings (classes C and D of classes AA, A, B, C, and D) are subject to the least stringent pollution limitations.

The theoretical basis for allowing higher pollution loading into a class C or class D stream is that pollution levels will be reduced through dilution and natural assimilation, so that by the time the water enters a drinking water reservoir (class AA), it will be sufficiently cleansed to meet the high quality AA standards. Desk-top computer models are used by NYS DEC to calculate the effect that a discharge will have on the quality of downstream streams and reservoirs. The use of these desk-top computer models was thoroughly explored during a recent NYS DEC Adjudicatory Hearing.[8] This hearing resulted from a proposal by NYS DEC to remove disinfection and allow greater pollution discharges from the Village of Delhi sewage treatment plant, which discharges into New York City's source waters.

The transcripts of the hearing reveal that the late Abel Wolman, along with other water quality experts from US EPA, NYS DOH, and NYC DEP, believe that the desk-top models significantly under-represent the downstream impacts of treatment plant discharges. Some of the modeling deficiencies uncovered during the hearing include: Use of coliform bacteria counts as an indicator of potential microbiological hazard downstream of the effluent. Testimony revealed that other organisms (especially protozoal parasites) are present in sewage and when discharged into source waters will outlive coliforms and hence are more indicative of pathogenic risk. Therefore, models based on coliform organisms may indicate "acceptable" impacts of an effluent on a downstream reservoir when the true pathogenic risk may in fact be unacceptable. Models are programmed based on "average" conditions of flow, climate and water quality, rather than "worst case" conditions in which pathogen kill and pollution assimilation is significantly decreased. Dr. Wolman pointed out that public health crises often result from a concomitant occurrence of unlikely events, and stressed the need for more conservative (worst case) modeling.

The sewage treatment plants discharging into New York City's source waters are neither designed nor intended to remove efficiently the myriad chemical and microbiological contaminants present in sewage, yet many of these same contaminants are regulated at the consumer's tap. The permits for these plants typically contain discharge limitations and monitoring requirements for only gross indicators of pollution, such as coliform organisms, suspended solids, settleable solids, biological oxygen demand, and pH. These permits contain neither monitoring requirements nor effluent limits for other toxic chemicals. Furthermore, the discharge monitoring requirements for the gross indicators of contamination are minimal at best, as some small plants conduct self-monitoring and are not required to submit their monitoring results to state agencies for review.[9]

New York State's Department of Environmental Conservation's in-stream water quality standards do exist for about 96 toxic contaminants. To date, no information has been published to indicate that waterways within New York City's watershed have been monitored for these contaminants.

Hundreds—or perhaps thousands—of wetland areas lie within the watershed and are critical components of the city's drinking water supply. These wetlands provide natural filtering capacity for pollution runoff in the watershed, and they are important in regulating hydrologic conditions, i.e., they prevent floods by acting as "sponges" and absorbing water during heavy rainfalls and snowmelts, and they slowly release the water afterward. Under the state's freshwater wetland protection regulations,[10] wetlands are to be mapped and classified from class 1 to 4, class one wetlands receiving the greatest protection from development and class 4 receiving the least. The regulations also require that any wetland "contiguous with, or adjacent to a water supply" must be classified class 1 and afforded maximum protection.

A major shortcoming to the state's wetland regulations is that only wetlands greater than 12.4 acres can be mapped and hence regulated by the state, unless extenuating circumstances can be demonstrated for a smaller wetland to be mapped. The remaining smaller wetlands can be regulated by local ordinances. Nationwide, numerous cases of wetland destruction by activities incongruous with water supply protection such as parking lots, shopping malls, debris landfills, etc. are known to exist. In many cases sewage treatment plants effluents are discharged directly into wetlands.

The New York Academy of Medicine urges that all source waters be afforded maximum protection. In addition, the New York Academy of Medicine believes that the State of New York should assure that all wetlands within the New York City watershed receive maximum protection as prescribed by the freshwater wetland regulations.

CONCLUSIONS AND RECOMMENDATIONS

The New York Academy of Medicine sees the need for New York State and City agencies, with oversight by the respective Departments of Health, to make serious commitments to: strict limitations, controls, and enforcement for infectious, chemical, and nutrient contaminants discharged or otherwise released into the city's watersheds; critical reevaluation of the regulatory structure including interagency responsibilities, enforcement and staffing by persons with water quality and public health expertise; responsible New York State land use controls on developments within the watershed, including prohibitions on development in certain critical areas (especially watershed

wetlands and areas adjacent to reservoirs); and future water quality strategies should be based upon comprehensive cost/benefit analyses, with particular emphasis on public health concerns.

The New York Academy of Medicine believes that new options for preserving water quality must be explored, including: prohibiting new discharges of sewage treatment plant effluents directly into New York City source waters, a prohibition similar to land use and discharge restrictions in force in the State of Connecticut;[11] purchasing or otherwise legally preserving large tracts of land in ecologically "sensitive" portions of the watershed and/or obtaining conservation easements from land owners; diverting existing wastewater discharges from watershed areas; and prohibiting incompatible developments, such as chemical industries, on the watershed.

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